

Chapter 8. National Compensation Measures

The BLS Office of Compensation and Working Conditions produces a variety of compensation measures. It also maintains a file of collective bargaining agreements and compiles work stoppage statistics.

Part one of this chapter describes an effort currently underway to integrate all the Office's wage and benefit measures into one comprehensive statistical program—called National Compensation Survey (NCS)¹—to provide a diverse set of measures of employee compensation. Part two deals with collective bargaining data.

Part 1. Compensation Measures

The NCS will replace the following three BLS programs that provide data on employer expenditures for wages, salaries, and benefits, as well as details of employer-provided benefit and establishment practices. These programs are:

Occupational Compensation Survey—The OCS provides data on the level and distribution of pay for selected work levels of white-collar and blue-collar occupations nationwide and in a variety of the Nation's local labor markets.

Employee Benefits Survey—The EBS is an annual study of the incidence and detailed characteristics of employer-provided benefits, such as time-off, insurance, and retirement programs.

Employment Cost Index—The ECI is a quarterly measure of the change in employer costs for employee compensation. It also provides employers' costs per hour worked for each of the components of compensation—wages, salaries, and employee benefits. The ECI is designated as a principal economic indicator.

These programs were developed at different times to meet different purposes. They have many overlapping data elements that result in duplication of data collection and processing. The NCS will eliminate duplication, develop more efficient collection and processing techniques, and improve

¹ The working title for this program was originally COMP2000.

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the quality of published data. Planning for The NCS began in 1994, and testing of data collection began in 1996.

The initial testing was limited to wage data; full implementation of the entire survey will be completed in 2000.

Background

Occupational pay and employee benefits

For over a century, the Bureau of Labor Statistics has conducted studies of wages by occupation and industry. The best known of the early Bureau studies stemmed from a Senate

resolution of March 3, 1891, which instructed its Committee on Finance to investigate the effects of tariff legislation on wages and prices. At the request of the committee, the Bureau developed detailed data for 1889-91 and more limited wage rate data extending back to 1860, and in some cases to 1840.

Systematic collection of wage data by occupation and industry continued after the turn of the century, with changes in coverage dictated mainly by government needs. Thus, a large survey program undertaken by the War Industries Board in 1919 produced occupational pay rates by industry and State, and, for some industries, by city. Between 1934 and 1940, the selection of industries studied was determined largely by administrative needs and the National Industrial Recovery Act, the Public Contracts Act, and the Fair Labor Standards Act, with emphasis on nationwide data for relatively low-wage industries.

Survey activity shifted in the early 1940s defense period to heavy industries essential to the war effort. Implementation of wage stabilization policy during the war required a large-scale program of occupational wage studies by industry and locality. The emphasis on data by locality continued after 1945 within the framework of industry studies generally designed to yield national and regional estimates.

Area wage surveys, initiated in the late 1940s, were designed to meet the growing demand for pay data related to office clerical and manual jobs that are common to a wide variety of manufacturing and nonmanufacturing industries within a metropolitan area. This survey program was firmly established and temporarily expanded for use in the wage stabilization effort during the Korean emergency. In 1960, the program was converted from a study of metropolitan areas of special interest to a statistically selected group of areas from which data could be projected to represent all metropolitan areas of the United States, excluding Alaska and Hawaii.

In 1960, the Bureau also began conducting an annual nationwide survey of professional, administrative, technical, and clerical jobs in a broad spectrum of private industries. The survey was begun in preparation for the Federal Salary Reform Act of 1962 and was used in administering both that act and the subsequent Federal Pay Comparability Act of 1970. These statutes called for comparability on a nationwide basis of salaries of Federal Government employees and those in the private sector. They governed changes in pay of most Federal white-collar employees until the passage of the Federal Employees Pay Comparability Act of 1990. The 1990 legislation provides for local variations in Federal white-collar pay scales in accordance with area differences in pay levels. Consequently, the Bureau's Occupational Compensation Survey program was restructured to give greater emphasis on locality studies.

Employee Benefits Survey

BLS has analyzed and presented data on the availability

and characteristics of employee benefits since the beginning of the 20th century. Early studies were often one-time examinations of a particular benefit, such as retirement income plans, or at the benefit activity of a particular establishment or labor union. The lack of a consistent series of data prior to World War II is not surprising, as employee benefits were uncommon and made up only a small proportion of total compensation.

During the 1940s a number of factors led to the expansion of employee benefits. These included: Wage controls during World War II and the early post war period that permitted supplementary benefit improvements while denying wage increases; National Labor Relations Board decisions bringing pensions and other benefits within the scope of compulsory collective bargaining; and clarifications of the Internal Revenue Code requiring employers who provide pensions to treat all workers equally. Recognizing these trends, the Bureau began to track employee benefits on a more regular basis.

The first recurring study of employee benefits began in the mid-1940s as part of the Bureau's occupational wage studies. These surveys yielded data on the incidence and provisions of paid vacation and sick leave plans and the incidence of insurance and pension plans for plant and office workers. Analysis of employee benefits expanded to emphasize provisions of individual plans. These studies, all based on small samples, were designed to provide information about particular benefit plans, such as health insurance and pensions. Published data included details of benefits established through collective bargaining as well as more general surveys of benefits provided by individual establishments.

In 1959, the Bureau initiated a series of surveys of employer expenditures for employee compensation. This program, which continued until 1977, measured outlays for individual elements of compensation, including pay for leave and contributions to private and public welfare and retirement plans.

In the 1970s, the General Accounting Office and two Presidential review groups noted the rapid growth of employee benefits, and recommended that the Federal Pay comparability system be expanded to include both pay and benefits. In response to these recommendations, the Office of Personnel Management (OPM) initiated its Total Compensation Comparability (TCC) project, designed to compare Federal and private pay and benefits. The Employee Benefits Survey was an outgrowth of this development. Although the TCC project was discontinued in the early 1980s, the Bureau continued the Employee Benefit Survey as part of its comprehensive series of compensation data.

Employment Cost Index

The ECI provides a quarterly measure of changes in the employers' cost for employee compensation, which includes wages, salaries, and employers' cost for employee benefits,

as well as annual data on cost levels. The ECI was developed in response to a frequently expressed need for such a statistical series. Existing measures, while adequate for specific purposes, were found to be fragmented, limited in industrial and occupational coverage, or insufficiently timely or detailed. The ECI survey was implemented in stages.

The initial series, introduced in 1976, was limited to wages and salaries in the private nonfarm economy, excluding establishments in Alaska and Hawaii, and private households. In November 1978, the survey was expanded to include establishments in these two States, and an additional 13 statistical series (for example, union/nonunion, manufacturing/nonmanufacturing). In 1980, the series was expanded to cover changes in total employee compensation. In November 1981, the series was expanded again to include State and local government units.

In 1987, the data collected for the ECI were used to produce measures of compensation cost levels. These are published annually with a March reference date.

Description of the Survey

The NCS covers civilian workers in private industry establishments and State and local governments in the 50 States and the District of Columbia. Federal Government, agriculture, and private households are excluded from coverage. Special surveys (such as those done by contract to meet the requirements of the Service Contract Act) may require the inclusion of establishments in other U.S. territories and possessions, such as Puerto Rico, but these areas will not be included in the basic program.

Establishments with one or more workers will be included in the NCS, regardless of industry. The establishment sample will be derived from a sample of metropolitan and nonmetropolitan areas designed to represent the United States. When fully implemented, the establishment sample will consist of about 35,000 units in 154 geographic areas.¹ (See exhibit 1 for areas to be included in this survey). Thirty-four of the metropolitan areas were selected with certainty. The remaining survey areas were statistically selected to represent the approximately 300 metropolitan areas and 2,500 nonmetropolitan counties in the United States. Prior to selection, all of these areas were arranged according to geographic region and average earnings. They were then grouped so that each group, or strata, of areas represented approximately the same number of workers and a probability sample of areas was selected from each stratum.

Within each survey area, BLS will select a sample of

business establishments and State and local government operations to represent the economic activity in that area. The size of individual area samples is determined by comparing the total nonfarm employment of the areas represented by the survey area with corresponding national employment. The individual business establishment and government operations to be studied will be selected using a probability proportionate to size technique. That is, larger establishments, in terms of total employment, will have a greater chance of selection than smaller establishments. Establishments are classified by industry as defined by the *Standard Industrial Classification Manual* (SIC) prepared by the U.S. Office of Management and Budget.

The sample will be divided into five panels, with the sample being fully replaced over a 5-year period. Each panel will be a cross section of the 154 geographic areas. A new replacement panel will be initiated every year, with the other four panels being updated.

Data on wage and benefit costs to be used in the calculation of the index will be collected for approximately one-third of the establishments. This information will be updated quarterly. Only wage data will be collected for the remaining two-thirds; these data will be updated annually.

In larger areas, the new sample will be collected throughout the year. In other areas, the entire new sample in a given area will be collected during a specified time period.

Selecting occupations

The mechanism for selecting occupational observations within an establishment will be through probability proportional to size sampling. That is, a fixed number of occupations will be selected in each establishment using a process that gives occupations with greater employment a greater chance of selection. This probability selection technique will result in data for jobs in proportion to their prevalence in the survey area.

Probability selection of occupations is designed to obtain a statistically representative sample of occupations for both a survey area and nationwide. The resulting data are weighted to represent all workers without bias. Through this technique, it is more likely that jobs that are prevalent in an establishment will be the ones chosen and studied. This method allows for the possibility of publishing data for any job group, not just for those jobs on a preset list.

Each selected occupation will be classified into one of approximately 450 occupation codes that are part of the Census Occupational Classification System, a hierarchical classification system with a number of levels that are broader than the occupation. This system divides occupations into major occupational groups (MOG's) and in some cases sub-MOG's. The major occupational groups listed below divide jobs according to general characteristics:

- Professional specialty and technical occupations
- Executive, administrative, and managerial occupations

¹Metropolitan Statistical Areas (MSAs) are areas with a central city of 50,000 or more inhabitants and a total population of at least 100,000. An MSA usually consists of one or more counties with close economic or social ties as defined by commuting patterns and population density. A nonmetropolitan area is a geographic area that has not been designated as part of an MSA.

- Sales occupations
- Administrative support, including clerical occupations
- Precision production, craft, and repair occupations
- Machine operator, assembler, and inspector occupations
- Transportation and material moving occupations
- Handler, equipment cleaner, helper, and laborer occupations (including forestry and fishing occupations)
- Service occupations.

The sub-MOG is a level finer than the MOG but still broader than the occupation. Examples include “natural scientists,” “information clerks,” and “food service occupations.”

During the initial phase of NCS, the Bureau has been using the Census occupation classification system to maintain consistency with the current Employment Cost Index. Currently, however, work is ongoing to revise the Standard Occupational Classification (SOC) system and to require its use for all Federal statistical programs. The NCS will switch to the SOC when the new system is ready for implementation.

Each selected occupation will be classified into one of several work levels based on duties and responsibilities. The process of determining the work level of an occupation is called generic leveling. It is generic because it is designed to determine the work level of nearly all occupations found in the economy. The work level of the occupation is determined using 10 factors, each of which is broken down into a number of levels. Each level has a written description and a fixed number of points. The 10 factors are:

- Knowledge
- Supervision received
- Guidelines
- Complexity
- Scope and effect
- Personal contacts
- Purpose of contacts
- Physical demands
- Work environment
- Supervisory duties.

The total points from all generic level factors determines the employee’s work level. Because the first nine factors are also used in the factor evaluation system to grade Federal General Schedule workers, this information can also be used to derive grade level equivalents for Federal workers.

Phased Implementation

The integration of the compensation measures will be implemented in stages. Initial NCS work is concentrating on occupational selection, determination of work levels, and collection of wage data. During 1996 and 1997, wage data will be collected for establishments with 50 or more

employees in all 154 areas composing the NCS sample. Beginning in 1998, a new program of benefit data will be collected using approximately one-third of the NCS sample. In 1999, wage data will be collected in all establishments with fewer than 50 employees. Several outstanding decisions (especially regarding data on benefits and construction of the index) await the results of ongoing tests and studies.

It is anticipated that the NCS will continue to collect cost data for the following benefits:

- Paid leave (Vacations, holidays, sick leave);
- Supplemental Pay (Premium pay for overtime and work on holidays and weekends);
- Retirement benefits (Defined benefit and defined contribution plans)
- Insurance (Life insurance, health benefits, sickness and accident insurance and long-term disability insurance);
- Legally required benefits (Social Security, Federal unemployment insurance, State unemployment insurance, and Workers’ compensation).

Data will also be collected on supplements to wages and salaries such as shift differentials and nonproduction cash bonuses.

Current procedures call for the computation of all earnings on the basis of the cost per hour worked, whether or not this is the actual basis of payment. Earnings of salaried employees and those paid under incentive systems are converted to an hourly basis. Benefit cost data are also converted to an hours worked basis. The addition of an alternative measure based on the cost of benefits per hour paid is being evaluated.

In the short term, the ECI will continue as a Laspeyres, fixed-weight index. By controlling for employment shifts across 2-digit industries and major occupations, the ECI shows how average total compensation paid by employers would have changed over time if the industrial-occupational composition of employment had not changed from the base period.

The possible introduction of an alternative index formula for computing indices of employer wage and benefits costs is under consideration. The effect of several alternative index formulas that would account for employment shifts across industries and occupations—such as Paasche, Fisher Ideal, and Tornqvist formulas—have been studied. Any new formulas would not be introduced until the new sample is completely phased in.

The existing ECI index is a measure of the employers’ cost for employee compensation. It shows changes in the “rate” of a given compensation package assuming constant usage unless the benefit plan is changed. Theoretically, absent such changes, the snapshot of the characteristics of the labor force at the time data from the establishment are first collected for the survey (i.e., overtime, tenure, longevity, and insurance and leave usage) remains unchanged.

This concept of the price of employers' obligation is under review. An alternative concept based on the "current cost" of the compensation package is under consideration. A compensation index based on a "current cost" approach would reflect changes in the compensation package for a unit of labor allowing for variation in the characteristics of the labor force. It would measure changes in the exchange rate that employers pay to workers in return for their labor services at different points in time. Thus, changes in the use of overtime, the number of workers on different shifts, lay-offs, new hires, and changes in the distribution of tenure would be captured.

The current definitions of straight-time wages and salaries, as well as weekly hours will be retained by the NCS. Straight-time wages and salaries exclude premium pay for overtime and for work on weekends, holidays, and late shifts. Also excluded are performance bonuses and lump-sum payments. Pay increases under cost-of-living clauses, and incentive payments are included. Standard hours reflect the workweek for which employees receive their regular straight-time salaries (exclusive of pay for overtime at regular and/or premium rates) and the earnings correspond to these weekly hours.

The NCS will adopt the individual worker as the basic unit of collection. Workers will be classified as union or nonunion, full or part time, and time or incentive workers.

Measures Produced During Transition Period

While several changes are under consideration, the Bureau will continue to produce measures of wages and compensation during the interim period as the NCS is phased in. The following describes the computation methods to be used during this period.

Ongoing index computation

During the transition period, the Bureau will continue to use the existing method to calculate the ECI. Alternative approaches will be introduced as parallel series in addition to the ongoing measures. The basic computational framework for the current ECI is the standard formula for an index number with fixed weights, as modified by the special statistical conditions that apply to the ECI. This discussion focuses on the ECI measures of wage changes, but indexes of compensation changes are calculated in essentially the same fashion.

An index for the ECI is simply a weighted average of the cumulative average wage changes within each establishment cell, with base-period wage bills as the fixed weights.

The simplified formula is:

$$I_t = \frac{\sum W_{o,i} M_{t,i}}{\sum W_{o,i}} \times 100$$

where:

$$M_{t,i} = M_{t-1,i} * R_{t,i}, \text{ and}$$

I_t is the symbol for the index.

The other variables are defined as follows:

$W_{o,i}$ is the estimated base-period (June 1989) wage bill for the i^{th} cell. A cell generally is an occupation in a 2-digit SIC industry, while the wage bill is the average wage of workers in the cell times the number of workers represented by the cell (the census weight).

$M_{t,i}$ is the cumulative average wage change in the i^{th} cell from time 0 (base period) to time t (current quarter).

$R_{t,i}$ is the ratio of the current-quarter weighted average wage in the cell to the prior-quarter weighted average wage in the cell, both calculated in the current quarter using matched establishment/occupation wage quotations. The weights applied are the sample weights described in the next section.

Since March 1995, 1990 employment counts from the Bureau's Occupational Employment Survey have been used; from June 1986 through December 1994, employment counts from the 1980 Census of Population were used; prior to that time, employment counts were taken from the 1970 census.

The index computation involves six principal steps:

1. Establishment occupation sample weights are applied to the average occupational wage in every establishment that has both current- and prior-quarter wage information. These data are used to calculate a weighted average wage for each cell (that is, occupation within industry) for the current and prior survey periods.
2. The ratio of current-quarter to prior-quarter weighted average wage is then calculated for each cell.
3. This ratio for each cell is multiplied by the cumulative percent change in wages in that cell over the period from June 1989 (the base) to the prior quarter. The product is the current-quarter cumulative percent wage change in the cell since the base period.
4. This measure of cumulative percentage wage change is multiplied by the base-period wage bill (the average wage in June 1989 multiplied by the fixed census weights) to generate an estimate of the current-quarter wage bill for the cell.

5. Both the current-quarter and the base-period wage bills are then summed over all cells within the scope of the index. For example, for the manufacturing index the wage bills would be summed across all industries and occupations in manufacturing.

6. The summed current-quarter wage bill is divided by the summed base-period wage bill. The result, when multiplied by 100, is the current quarter index. That index is divided by the prior-quarter index to provide a measure of quarter-to-quarter change, the link relative.

The computations for the occupational and industry groups follow the same procedures as those for the overall indexes except for summation. The wage bills for the occupational groups are summed across occupational groups and regions for each industry division.

Computation procedures for the regional, union/nonunion, and metropolitan/nonmetropolitan measures of change differ from those of the national indexes because the current sample is not large enough to hold constant the wage bills at that level of detail. The employment weights are, therefore, reallocated each quarter within these series based on the current ECI sample. The indexes for these series, consequently, are not strictly comparable to those for the aggregate, industry, and occupation series.

Seasonal adjustment

Over the course of a year, the rate of wage and benefit cost changes is affected by events that follow a more or less regular pattern each year. For example, wage and benefit adjustments in State and local governments, especially schools, are concentrated in the June-September period. Increases in the Social Security tax rate and earnings ceiling, when they occur, always take effect in the December-March period. Wage and benefit adjustments in construction occur in the summer when there is the most activity in the industry.

Adjusting for these seasonal patterns makes it easier to observe the cyclical and other nonseasonal movements in the series. In evaluating changes in a seasonally adjusted series, it is important to note that seasonal adjustment is merely an approximation based on past experience. Seasonally adjusted estimates have a broader margin of possible error than the original data on which they are based, since they are subject not only to sampling and other errors but are also affected by the uncertainties of the seasonal adjustment process itself.

Beginning with the December 1990 ECI statistics, major industry and occupational series are seasonally adjusted using a procedure called X-11 ARIMA (Auto-Regressive Integrated Moving Average). This procedure was developed at Statistics Canada as an extension of the standard X-11 method.

At the beginning of each calendar year, seasonal adjustment factors are calculated for use during the coming year. The seasonal factors for the coming year are published in the March issue of the Bureau publication *Compensation and Working Conditions (CWC)*. Revisions of historically seasonally adjusted data for the most recent 5 years also appear in the March CWC.

ECI series are seasonally adjusted using either direct or composite estimates. Most industry and occupational series such as construction, for example, are adjusted directly. The civilian, State and local governments, private industry, and manufacturing series are adjusted using composite estimates. The seasonally adjusted civilian compensation series, for example, is computed by aggregating the following independently adjusted series: Private goods-producing wages, private goods-producing benefits, private service-producing wages, private service-producing benefits, State and local government wages, and State and local government benefits. (Goods-producing wages has no identifiable seasonality, so the seasonally adjusted and unadjusted series are identical.)

Revised Procedures for the Calculation of Wage Levels

The formula used for calculating the mean hourly wage and weekly wages used as the basic methodology for the NCS differs from existing ECI methodology in two areas: distribution of the weight of the sampled occupation over all individual rates in the selected occupations and inclusion of hours worked in the calculation of the mean hourly wage. These procedures have been used in the calculation of wage levels since 1996.

In the base period, the weight for each sampled occupation will be divided evenly over each individual worker in the quote. This individual weight will remain fixed as long as the quote is in the sample. The wage rate of each individual in the quote will be multiplied by the individual weight, even if the employment in the quote has increased or decreased over time.

The following estimation formulas are used for computing the mean wage for the NCS.

(1) Average weekly wage

$$\frac{\sum_{q \in D} \sum_l (Y_{ql} * X_{ql} * W_q)}{\sum_{q \in D} \sum_l (X_{ql} * W_q)}$$

(2) Average hourly wage

$$\frac{\sum_{q \in D} \sum_l (Y_{ql} * X_{ql} * W_q * H_{ql})}{\sum_{q \in D} \sum_l (X_{ql} * W_q * H_{ql})}$$

where subscript D is the domain of interest (e.g., occupation x level, MOG x level).

Subscript q is the quote and l is the wage record.

Y_{ql} is the weekly wage rate in formula (1) and hourly wage rate in formula (2) of a particular worker or group of workers in a particular quote.

X_{ql} is the number of workers for a particular wage rate.

H_{ql} is the number of weekly hours paid for a particular worker.

(NOTE: Weekly hours paid is only used when computing average hourly wage.)

W_q is the individual weight. The individual weight is calculated by dividing the final quote weight by the number of employees in the quote. The final quote weight is a product of the establishment corrected weight, the establishment nonresponse factor, the occupational MOG/level nonresponse factor, the occupational MOG nonresponse factor, and the probability selection of occupation interval.

There are basically two types of nonresponse adjustments used—reweighting and data imputation. The techniques used vary depending upon the individual series. To assure comparability among the NCS series, BLS anticipates that a common nonresponse adjustment procedure will be adopted.

Counting the Incidence of Employee Benefits

The incidence of employer provided benefits can be described in a variety of ways. One approach counts the number or percentage of employees who provide “access” to a given benefit. However, just because an establishment offers a benefit doesn’t guarantee that all employees are covered, or even that all employees are eligible for coverage. Access to the benefit may be limited to certain workers or the plan may set other requirements, such as a specific length of service. In addition, some employees may elect not to participate.

BLS data on the incidence of employee benefits show the percent of all employees who receive specified benefits, such as paid holidays or medical care, as well as information on the provisions of many of these benefits. To present provision data, tabulations generally indicate the percent of all employees receiving a benefit (participants) who are covered by specified features. For example, a tabulation may show the percent of workers with medical care benefits who are covered by a health maintenance organization.

The survey design uses an estimator that assigns the inverse of each sample unit’s probability of selection as a weight to the unit’s data at each of the two stages of sample selection. Three weight-adjustment factors are applied to the

establishment data. The first factor is introduced to account for establishment nonresponse and a second factor for occupational nonresponse. A third poststratification factor is introduced to adjust the estimated employment totals to actual counts of employment by industry for the survey reference date.

The general form of the estimator for a population total Y is:

$$Y = \sum_{i=1}^{n'} \frac{f_{2i} f_{1i}}{P_i} \sum_{j=1}^{o_i} \frac{Y_{ij} f_{ij}}{P_{ij}}$$

where,

n' = number of responding sample establishments;

o_i = occupation sample size selected from the i^{th} establishment;

Y_{ij} = value for the characteristics of the j^{th} selected occupation in the i^{th} selected establishment;

P_i = the probability of including the i^{th} establishment in the sample;

P_{ij} = the probability of including the j^{th} occupation in the sample of occupations from the i^{th} establishment;

f_{1i} = weight adjustment factor for nonresponse for the i^{th} establishment;

f_{ij} = weight adjustment factor for nonresponse for the j^{th} occupation in the i^{th} establishment;

f_{2i} = weight adjustment factor for poststratification totals for the i^{th} establishment.

Appropriate employment or establishment totals are used to calculate the proportion, mean, or percentage that is desired.

Reliability of Estimates

There are two types of errors possible in the estimates from any sample survey—sampling and nonsampling errors.

Nonsampling errors have a number of potential sources. The primary sources are (1) survey nonresponse and (2) data collection and processing errors. Nonsampling errors are not measured. Procedures have been implemented for reducing nonsampling errors, however, primarily through quality assurance programs. These programs include the use of data collection reinterviews, observed interviews, computer edits of the data, and systematic professional review of the reports on which the data are recorded. The programs also serve as a training device to provide feedback to the field economists, or data collectors, on errors. And, they provide information on the sources of error which can be remedied by improved collection instructions or computer processing edits. Extensive training of field economists is

also conducted to maintain high standards in data collection.

Sampling errors are differences that occur between the results computed from a sample of observations and those computed from all observations in the population. The estimates derived from different samples selected using the same sample design may differ from each other.

A measure of the variation among these differing estimates is the standard error. It can be used to measure the precision with which an estimate from a particular sample approximates the average result of all possible samples. The standard error can be used to define a range (confidence interval) around the estimate. The 95-percent confidence level means that if all possible samples were selected and an estimate of the value and its sampling error were computed for each, then for approximately 95 percent of the samples, the intervals from 2 standard errors below the estimates to 2 standard errors above the estimates would include the “true” average value. For example, the 95-percent confidence interval for a cost estimate of \$10 with a standard error of 10 cents would be \$10.00 plus or minus 20 cents (2 x 10 cents) or \$9.80 to \$10.20.

Output Measures

When fully implemented, the following types of measures are envisioned for the NCS:

Indices. An index of the change in employer cost for compensation. There will be separate series for total compensation, wages and salaries, total benefits, benefit groupings, and some individual benefits.

Cost levels. Employer cost for compensation expressed as a cost per hour. There will be separate series for total compensation costs, wages and salaries, total benefit costs, and the costs of individual benefit items.

Wages and salary levels. Straight-time hourly and weekly wages and salaries.

Benefit incidence and provisions. The number and percent of employees offered and covered by selected benefits; the number and percent of employees offered choices of benefits; and the selections made based on those choices; and the number and percent of employees participating in benefit plans with detailed provisions.

Benefit incidence and costs. The percent of establishments offering selected benefits, the aggregate cost of selected benefits in establishments, the cost of selected benefits per establishment, the cost of selected benefits per employee, and the cost associated with specific benefit provisions.

Establishment practices. The number and percent of establishments and employees covered by selected establishment practices.

Collective bargaining. The number and percent of employees covered by collective bargaining agreements.

At both the local and national level, BLS will publish at the finest level of occupational detail that the data will allow. Thus, the more prevalent the job, the greater the chance that BLS will have publishable data. The list of publishable jobs will vary from area to area, and more specific jobs may be published in regional or national publications than in individual area publications. The number of localities that will yield publishable data is not determined. Wages and salary levels for occupations will be published in at least 30-35 localities, primarily the largest metropolitan areas. If resources allow, other measures—indices, cost levels, benefit incidence and provisions—will be published for the nine Census regions (see exhibit 2) and for the Nation’s largest metropolitan areas.

The NCS will provide annual data on the incidence of specific benefits and key provisions in the national economy. On a cycle that has yet to be determined, additional detailed information on specific provisions will be produced. For example, studies of health care provisions one year, followed by retirement the next year.

Data Collection

Data collection strategies are being field tested, but the following is the likely scenario for the NCS:

- On-site visits by field economists to select jobs, collect wage and benefit data, and arrange for subsequent reporting of updated information,
- Use of benefit plan descriptions by Washington national office staff to extract detailed plan provisions data, and
- Use of mail and telephone surveys primarily to update data collected initially by personal visit.

Uses and Limitations

The compensation, wage, and benefit data developed in BLS surveys have a variety of uses. Federal, State, and local agencies use them in compensation administration and in the formulation of public policy on compensation as in minimum wage legislation. They are of value to Federal and State mediation and conciliation services and to State employment compensation agencies in judging the suitability of job offers.

Bureau data also are used in private compensation determinations by employers or through the collective bargaining process. To the extent that wages and benefits are a factor, survey data are considered by employers in selecting

locations for new facilities and in cost estimating relating to contract work.

In addition, the data are used in economic analysis. Knowledge of levels, structures, and trends of pay rates and benefit practices is required in the analysis of current economic developments and in studies relating to wage dispersion and differentials. The integration of the compensation surveys will allow, for the first time, the ability to link the costs to specific benefit practices, because all data will be based on the same survey methodology and definitions.

The Employment Cost Index has been designated a principal Federal economic indicator by the Office of Management and Budget. It is the only measure of labor costs that treats wages and salaries and total compensation consistently, and provides consistent subseries by occupation and industry. The ECI is used by the Federal Reserve Board to monitor the effects of fiscal and monetary policies and in formulating those policies. It enables analysts and policymakers to assess the effect of labor cost changes on the economy, both in the aggregate and by sectors. The ECI is particularly important in studies of the relationships between prices, productivity, labor costs, and employment.

While these measures of compensation have many uses, their limitations must be kept in mind. The data are subject to sampling errors, which may cause deviations from the results that would be obtained if the actual records of all establishments could be used.

Part 2. Industrial Relations

As required under the provisions of the National Labor Relations Act of 1947 (also known as the Taft-Hartley Act), the Bureau maintains a file of collective bargaining agreements and compiles data on work stoppages. The measures of negotiated wage and benefit changes for collective bargaining agreements covering 1,000 workers or more in private industry and State and local government were discontinued in 1995 because of budget constraints.

Public File of Collective Bargaining Agreements

The Bureau maintains approximately 2,000 collective bargaining agreements available for public use. The file includes virtually all agreements in both private industry and State and local government covering 1,000 workers or more. (Railroad and airline industry agreements, which are required to be filed with the National Mediation Board, are not included in this file.) Copies of agreements are provided voluntarily by signatories. A few agreements are submitted in confidence and are not available for public use.

Dating back to the late 1940s, the file contains both recent and prior contracts. New units are added as they occur. Source material for adding new units include election

reports, the National Labor Relations Board, union newspapers and magazines, and newspaper clippings.

Listings of the file contents are readily available. They are sorted by company name (or State and local government), union, industry, and location. These listings are updated monthly.

Work Stoppages

The statistical series on work stoppages began in 1947, covering all work stoppages in the United States that idled six workers or more and continued for the equivalent of a full day or shift or longer. Data for this series were discontinued in 1981 because of budget reductions.

The Bureau currently compiles data on work stoppages involving 1,000 or more workers for at least a full day or shift. The information includes monthly listings of companies or governments involved in a work stoppage, along with the name of the union involved in the dispute, the location of the stoppage, the beginning and ending dates of the dispute, the number of workers idled by the stoppage, and days of idleness.

Definitions and methods. A *strike* is a temporary stoppage of work by a group of employees (not necessarily members of a union) to express a grievance or enforce a demand. A *lockout* is a temporary withholding or denial of employment during a labor dispute to enforce terms of employment upon a group of employees. Because of the complexity of most labor-management disputes, the Bureau makes no attempt to distinguish between strikes and lockouts in its statistics; both terms are included in the term "work stoppage."

Workers involved include those who initiate the strike as well as others in the establishment who honor picket lines or are idled because the plant is closed down. Other branches or plants of the struck employer may also be affected.

The *number of days idle* include all workers made idle for one shift or longer in establishments directly involved in a stoppage. They do not account for secondary idleness, that is, the effects of a stoppage on other establishments or industries whose employees may be made idle as a result of material or service shortages. The figure does however, include idleness at other plants or facilities of the establishment struck.

Estimated working time lost is computed by multiplying the employment for the period by the number of days typically worked by most employed workers during that period. In these computations, Saturdays (when customarily not worked), Sundays, and established Federal holidays are excluded. The estimated working time lost for the reference period is calculated by dividing the days of idleness for that period by the available workdays for the period.

Sources of information. Information on the actual or probable existence of a work stoppage is collected from a num-

ber of sources. They include weekly reports of the Federal Mediation and Conciliation Service, State Bureau of Employment Security reports, union newspapers and periodicals, the *Daily Labor Report*, and clippings of labor disputes obtained from a number of major daily and weekly newspapers.

Analysis and Presentation

The Bureau's *Compensation and Working Conditions* periodical is a depository of information on all the compensation measures produced by the BLS Office of Compensation and Working Conditions.

Beginning in June 1996, this periodical was revised to reflect a shift in emphasis from collective bargaining to compensation. This publication is issued quarterly in March, June, September, and December.

Analysis and data derived from the various compensation measures are also presented in news releases, reports, summaries, bulletins, and *Monthly Labor Review* articles. Data are also available on LABSTAT, the Bureau's public use database, and through the Internet. Current information about national wage and compensation programs can be accessed at: <http://stats.bls.gov:80/comhome.htm>

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Exhibit 1. List of areas included in the National Compensation Survey

Consolidated metropolitan statistical areas

Boston-Worcester-Lawrence, MA-NH-ME-CT
Chicago-Gary-Kenosha, IL-IN-WI
Cincinnati-Hamilton, OH-KY-IN
Cleveland-Akron, OH
Dallas-Fort Worth, TX
Denver-Boulder-Greeley, CO
Detroit-Ann Arbor-Flint, MI
Houston-Galveston-Brazoria, TX
Los Angeles-Riverside-Orange County, CA
Miami-Fort Lauderdale, FL
Milwaukee-Racine, WI
New York-Northern New Jersey-Long Island, NY-NJ-CT-PA
Philadelphia-Wilmington-Atlantic City, PA-NJ-DE-MD
Portland-Salem, OR-WA
Sacramento-Yolo, CA
San Francisco-Oakland-San Jose, CA
Seattle-Tacoma-Bremerton, WA
Washington-Baltimore, DC-MD-VA-WV

Other published areas

Atlanta, GA
Charlotte-Gastonia-Rock Hill, NC-SC
Columbus, OH
Dayton-Springfield, OH
Hartford, CT
Huntsville, AL
Indianapolis, IN
Kansas City, MO-KS
Minneapolis-St. Paul, MN-WI
Orlando, FL
Phoenix-Mesa, AZ
Pittsburgh, PA
Richmond-Petersburg, VA
San Diego, CA
St. Louis, MO-IL
Tampa-St. Petersburg-Clearwater, FL

Nonpublished metropolitan areas

Amarillo, TX
Anchorage, AK
Augusta-Aiken, GA-SC
Austin-San Marcos, TX
Birmingham, AL
Bloomington, IN
Bloomington-Normal, IL

Brownsville-Harlingen-San Benito, TX
Buffalo-Niagara Falls, NY
Charleston-North Charleston, SC
Corpus Christi, TX
Elkhart-Goshen, IN
Fort Collins-Loveland, CO
Grand Rapids-Muskegon-Holland, MI
Great Falls, MT
Greensboro-Winston Salem-High Point, NC
Greenville-Spartanburg-Anderson, SC
Hickory-Morganton-Lenoir, NC
Honolulu, HI
Iowa City, IA
Johnstown, PA
Kalamazoo-Battle Creek, MI
Knoxville, TN
Lincoln, NE
Louisville, KY-IN
Melbourne-Titusville-Palm Bay, FL
Memphis, TN-AR-MS
Mobile, AL
New Orleans, LA
Norfolk-Virginia Beach-Newport News, VA-NC
Ocala, FL
Oklahoma City, OK
Providence-Fall River-Warwick, RI-MA
Raleigh-Durham-Chapel Hill, NC
Reading, PA
Reno, NV
Richland-Kennewick-Pasco, WA
Rochester, NY
Rockford, IL
Salinas, CA
San Antonio, TX
Springfield, MA
Springfield, MO
Tallahassee, FL
Visalia-Tulare-Porterville, CA
York, PA
Youngstown-Warren, OH

Nonpublished nonmetropolitan areas

Andrews, TX
Bannock, ID
Bradley, TN
Carson City, NV
Cheshire, NH

Exhibit 1. List of areas included in National Compensation Survey—Continued

Nonpublished nonmetropolitan areas—Continued

Cheyenne, CO	Liberty, GA
Choctaw, AL	Lincoln, WY
Citrus, FL	Logan, NE
Clatsop, OR	Madison, NE
Clinton, IA	Marshall, IN
Clinton, NY	Monroe, OH
Columbia, NY	Montgomery, VA
Craven, NC	Moore, NC
Crook, OR	Morgan, IL
Decatur, GA	Northumberland, PA
Delta, MI	Orange, VT
Des Moines, IA	Palo Pinto, TX
Dorchester, MD	Panola, TX
Fairbanks-North Star, AK	Polk, NC
Fergus, MT	Pope, AR
Fond Du Lac, WI	Prairie, AR
Franklin, VA	Sauk, WI
Freeborn, MN	Seneca, OH
Georgetown, SC	Seward, NE
Gillespie, TX	Skagit, WA
Goodhue, MN	St. Francis, AR
Grafton, NH	St. Lawrence, NY
Green Lake, WI	Tama, IA
Greenwood, SC	Tattnall, GA
Griggs, ND	Taylor, KY
Harrison, KY	Tunica, MS
Henderson, IL	Vermilion, LA
Henry, AL	Ward, ND
Jefferson, IN	Wasco, OR
Juneau, AK	Washington, GA
Juneau, WI	Wayne, OH
Kauai, HI	Wayne, TN
Lee, MS	Winston, MS
Lewis, MO	Yavapai, AZ

Exhibit 2. Census regions

New England

Connecticut
Maine
Massachusetts
New Hampshire
Rhode Island
Vermont

Middle Atlantic

New Jersey
New York
Pennsylvania

East South Central

Alabama
Kentucky
Mississippi
Tennessee

South Atlantic

Delaware
District of Columbia
Georgia
Florida
Maryland
North Carolina
South Carolina
Virginia
West Virginia

East North Central

Illinois
Indiana
Michigan
Ohio
Wisconsin

West North Central

Iowa
Kansas
Missouri
Minnesota
Nebraska
North Dakota
South Dakota

West South Central

Arkansas
Louisiana
Oklahoma
Texas

Mountain

Arizona
Colorado
Idaho
Montana
Nevada
New Mexico
Utah
Wyoming

Pacific

Alaska
California
Hawaii
Oregon
Washington